

We Claim:

1.

A workholding apparatus comprising:

a body;

at least one drive member carried by said body, said at least one drive member and said body at least partially defining a fluid chamber therebetween for containing a fluid, said at least one drive member having an annular flange portion axially abutting and attached to at least a portion of said body; and

at least one driven member carried by said body, said at least one driven member having at least one displacement relief therein.

2.

The workholding apparatus of claim 1, further comprising at least one interengagement feature interengaging said at least one drive member and said at least one driven member to resist said at least one driven member from twisting relative to said at least one drive member.

3.

The workholding apparatus of claim 1, further comprising at least one drive pin extending radially through a portion of said at least one driven member and a portion of said at least one drive member to resist said at least one driven member from twisting relative to said at least one drive member.

4.

The workholding apparatus of claim 3, wherein said at least one drive pin extends radially through an axially elongated relief in said at least one driven member and into said annular flange portion of said at least one drive member.

5.

The workholding apparatus of claim 1, wherein said at least one drive member and said at least one driven member are threaded together to resist said at least one driven member from twisting relative to said at least one drive member.

6.

The workholding apparatus as claimed in claim 1, wherein said at least one drive member and said at least one driven member are splined together to resist said at least one driven member from twisting relative to said at least one drive member.

7.

The workholding apparatus as claimed in claim 1, further comprising:
a ring member disposed axially rearward of said at least one driven member; and
at least one drive pin extending axially through at least a portion of said at least one driven member and into a portion of said ring member to resist said at least one driven member from twisting relative to said at least one drive member.

8.

The workholding apparatus as claimed in claim 7, further comprising a nose piece mounted to said body axially forward of said at least one driven member, said at least one drive pin further extending axially into a portion of said nose piece to further resist said at least one driven member from twisting relative to said at least one drive member.

9.

The workholding apparatus as claimed in claim 1, further comprising means for resisting said at least one driven member from twisting relative to said at least one drive member.

10.

The workholding apparatus of claim 1, wherein said workholding apparatus is an arbor such that the workpiece substantially circumscribes said at least one driven member and the fluid pressure acts through said at least one drive member to expand said at least one driven member radially outwardly into engagement with the workpiece.

11.

An apparatus to releasably retain a workpiece, said apparatus comprising:
a body;

at least one diaphragm carried by said body and defining at least in part a fluid chamber constructed to contain a fluid, said at least one diaphragm having an annular flange portion axially abutting and attached to at least a portion of said body;

at least one collet having at least one displacement relief, a diaphragm engaging surface, and a workpiece engaging surface, said at least one collet being carried by said body; and

whereby when said fluid in said fluid chamber is pressurized a drive force is transmitted through said at least one diaphragm and said at least one collet to urge said at least one collet into engagement with the workpiece to releasably retain the workpiece.

12.

The workholding apparatus of claim 11, further comprising at least one interengagement feature interengaging said at least one drive member and said at least one driven member to resist said at least one driven member from twisting relative to said at least one drive member.

13.

The workholding apparatus of claim 11, further comprising a drive pin extending radially through a portion of said at least one collet and a portion of said at least one diaphragm to resist said at least one collet from twisting relative to said at least one diaphragm.

14.

The workholding apparatus of claim 13, wherein said drive pin extends radially through an axially elongated relief in said at least one collet and into said annular flange portion of said at least one diaphragm.

15.

The workholding apparatus of claim 11, wherein said at least one diaphragm and said at least one collet are threaded together to resist said at least one collet from twisting relative to said at least one diaphragm.

16.

The workholding apparatus as claimed in claim 11, wherein said at least one diaphragm and said at least one collet are splined together to resist said at least one collet from twisting relative to said at least one diaphragm.

17.

The workholding apparatus as claimed in claim 11, further comprising:
a ring member disposed axially rearward of said at least one collet; and
at least one drive pin extending axially through said at least one collet and into a portion of said ring member to resist said at least one collet from twisting relative to said at least one diaphragm.

18.

The workholding apparatus as claimed in claim 17, further comprising a nose piece mounted to said body axially forward of said at least one collet, said at least one drive pin further extending axially into a portion of said nose piece to further resist said at least one collet from twisting relative to said at least one diaphragm.

19.

The workholding apparatus as claimed in claim 11, further comprising means for resisting said at least one collet from twisting relative to said at least one diaphragm.

20.

The workholding apparatus of claim 1, wherein said workholding apparatus is an arbor such that the workpiece substantially circumscribes said at least one collet and fluid pressure acts through said at least one diaphragm to expand said at least one collet radially outwardly into engagement with the workpiece.

21.

A collet used in conjunction with a workholding apparatus, said collet having interengagement elements projecting therefrom and engaging at least one other component of said workholding apparatus to resist twisting of said collet on said workholding apparatus.

22.

A method of holding a workpiece comprising the steps of:

providing a body;

mounting at least one drive member on said body, said at least one drive member and said body at least partially defining a fluid chamber therebetween for containing a fluid, said at least one drive member having an annular flange portion axially abutting and attached to at least a portion of said body; and

mounting at least one driven member to said body, said at least one driven member having at least one displacement relief therein.

23.

The method as claimed in claim 22, further comprising the step of providing at least one interengagement feature that interengages said at least one drive member and said at least one driven member to resist said at least one driven member from twisting relative to said at least one drive member.